RAMMAX

company of the Ammann Group

Vibratory Roller

Operating and service instructions

RW 1800
S/SP/SPT

RAMMAX
Maschinenbau GmbH
Gutenbergstraße 33
72555 Metzingen
Phone: ++49 (0) 7123 / 9223-0
Fax: ++49 (0) 7123 / 9223-50
E-Mail: Service@Rammax.de
Germany

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Technical modifications reserved

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Foreword :

The field-experienced development and construction as well as the manufacturer's long years of experience in the production of vibratory trench rollers are the guarantee for very best quality and utmost reliability of your roller.

This operating and service manual includes the following items :

- safety regulations
- description of the machine
- operating instructions
- maintenance instructions
- trouble shooting table

Respecting this manual

- makes it easier to get to know the machine.
- helps avoid malfunctions or disturbances due to improper use.

Keeping to the maintenance instructions

- increases the roller's reliability during operation on job sites,
- prolongs the machine's working life,
- helps reduce repair costs and downtimes.

RAMMAX-Maschinenbau GmbH will not assume any liability for the functioning of the machine

- if it is operated in a manner that does not correspond to the proper operation,
- if it is used in fields of application for which it is not provided and which do not correspond to proper use (see paragraph 3.1) or which differ from the proper fields of application (paragraph 2.1).

No warranty can be claimed if :

- mistakes are made in operation,
- no maintenance checks and/or works are carried out,
- wrong fuel is used.

Note :

- This manual has been written for operating and service staff on the job sites.
- This operating and maintenance manual is to be kept ready to hand near the machine.
- Operating the roller is only allowed after the operator has been trained on it and in accordance with the present instructions.
- The safety regulations described in paragraph 3.0 on pages 13 to 20, the „Safety guidelines for the operation of road rollers and ground compactors", issued by the Civil Engineering Employer's Liability Insurance Association, and the rules for prevention of accidents must absolutely be observed.

For your own safety and in order to avoid disturbances of the machine's functioning, only Rammax spare parts must be used (paragraph 2.2 „Modifications on the machine").

The spare parts list and operating manual can also be supplied in different languages through your Rammax dealer by indicating the roller's serial number.

The warranty and liability conditions as provided in RAMMAX-Maschinenbau GmbH's General Terms and Conditions are neither extended nor substituted by the above-mentioned or following remarks.

Rammax GmbH Metzingen

Please fill in when handing over the machine :

.....
Roller model (Fig. 3)

.....
Serial number (Fig. 1)

.....
Engine model

.....
Engine serial number (Fig. 2)

Fig. 1

Attention :

When taking over the roller, you will be trained in operation and maintenance by one of our employees or by our dealer. Here, it will be absolutely necessary to respect the safety remarks and danger warnings.

Fig. 2

Fig. 3

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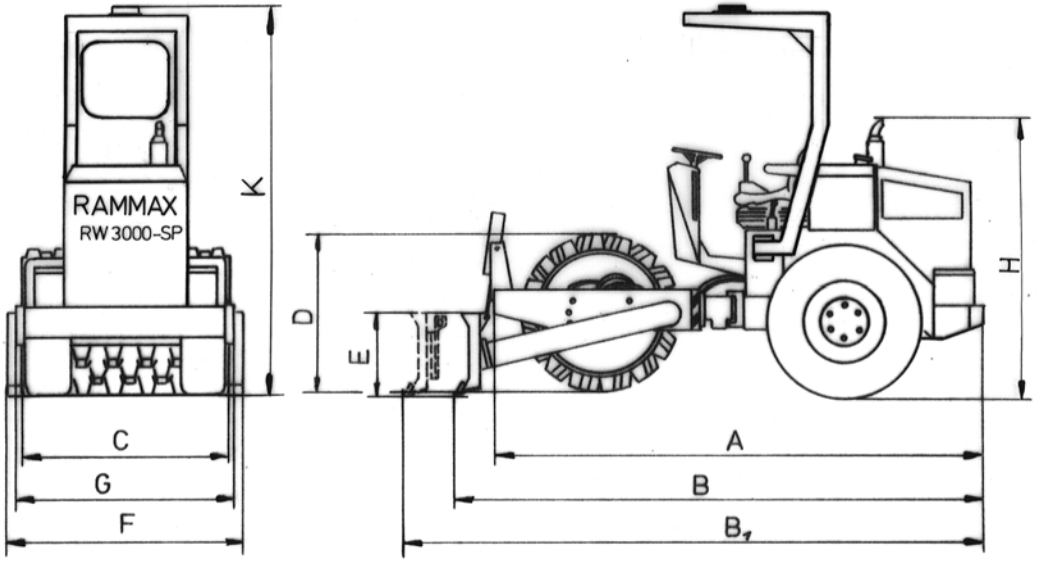
1.0 Technical specifications



1.1 Main dimensions

Dimensions in cm :	A	B_1	B_2	C	D	E	F	G	H_1	K
RW 1800-S :	274	----	----	90	79	---	----	130	167	226,5
RW 1800-SP :	274	----	311	90	79	36	140	130	167	226,5
RW 1800-SPT :	274	320	311	90	79	36	140	130	167	226,5

Technical specifications :

Weights :	**RW 1800 S**	**RW 1800 SP**	**RW 1800 SPT**
Dead weight :	1920 kg	2120 kg	2280 kg
Operating weight :	1970 kg	2190 kg	2340 kg
Centre axle load :	985 kg	1095 kg	1170 kg
Driving qualities :			
Driving speed forward/reverse :			
with vibration :	0-2,7 km/h	0-2,7 km/h	0-2,7 km/h
without vibration :	0-2,7 km/h	0-2,7 km/h	0-2,7 km/h
Maximum gradeability :			
with vibration :	45 %	45 %	45 %
without vibration :	45 %	45 %	45 %
Maximum inclination :	45 %	45 %	45 %
Drive :			
Engine manufacturer :	Kubota	Kubota	Kubota
Type :	D-1403	D-1403	D-1403
Cooling :	water cooled	water cooled	water cooled
Number of cylinders :	3	3	3
Engine output :	22,8 kW (31 HP)	22,8 kW (31 HP)	22,8 KW (31 HP)
Number of revolutions :	2600 rpm	2600 rpm	2800 rpm
Battery :	12V 55Ah	12V 55Ah	12V 55Ah
Drive :	hydrostatic	hydrostatic	hydrostatic
Wheel shaft with drive :	front/rear	front/rear	front/rear
Electrical system :	12 V	12 V	12 V
Brakes :			
Service brake :	hydrostatic	hydrostatic	hydrostatic
Parking brake :	mechanical	mechanical	mechanical
Steering :			
Steering type :	articulated steering	articulated st.	articulated steering
Steering application :	hydrostatic	hydrostatic	hydrostatic
Vibration system :			
Drive :	hydrostatic	hydrostatic	hydrostatic
Frequency :	34 Hz	34 Hz	34 Hz
Amplitude :	1,6 mm	1,6 mm	1,6mm
Centrifugal force :	64 kN (6400 kp)	64 kN (6400 kp)	64 kN (6400 kp)

Tank capacities :

Fuel :	40 l	40 l	40 l
Hydraulic oil :	140 l	140 l	140 l

Tires :

Number of tires :	2	2	2
Tire size :	7.50 - 16 AS	7.50 - 16 AS	7.50 - 16 AS
Inflation pressure :	2,5 bar	2,5 bar	2,5 bar

1.2 Noise and Vibration values

The following noise and vibration values according to the EC machinery regulation (edition 93/68/EWG) have been measured under typical operating conditions for this machine with vibration and over a predetermined travel distance (DIN 45635).

During operation, these values may vary in accordance with the existing operating conditions.

Noise values

The sound level according to appendix 1, paragraph 1.7.4.f of the EC machinery regulation is

- Sound pressure level at the operator's stand : L_{pA} **= 91,5 dB(A)**

- Sound capacity level : L_{WA} **= 106,7 dB(A)**

These sound values were determined according to ISO 6081 for the sound pressure level (L_{pA}) and ISO 3744, DIN 45635, for the sound capacity level (L_{WA}).

Vibration value

The vibration values according to appendix 1, paragraph 2.2 or 3.6.3. a of the EC machinery regulation are :

Technical modifications reserved.

Rammax RW 1800

2.0 Description

A long lasting experience in the construction of vibration rollers, continuous development and improvement and most recent engineering techniques have been the starting points for the construction of a series of most powerful vibration rollers - the RW 1800 series. All different types of this series offer a high degree of operating comfort, a rugged and compact construction and a high degree of operating safety for the driver during operation. The RAMMAX vibration roller RW 1800 is a self-propelled articulated vibration roller, which can be equipped either with smooth drum or with padfoot drum and with a dozer blade at choice. Additionally, the RW 1800 can be ordered incorporating a tilt function of the dozer blade which allows to produce an even level of the ground even though the roller is driving on a slope in an oblique position.

The dozer blade of all RW 1800 series rollers is operated by one hand lever control. Drive, vibration, steering and brakes work hydraulically. Drum and tires are powered independently from each other and infinitely variable by two variable capacity pumps. The drive function is operated over two foot pedals.

This drive system allows a very high gradeability of the roller (up to 45%, depending on the nature of the soil).

2.1 Fields of application :

The vibration roller RW 1800 has especially been designed for earth levelling and ground compaction works. The ideal application for this modern vibration roller is the compaction of wet, cohesive soils and clays in canal works, in the pipeline construction, road subcourses, construction site reinstatements, etc.

2.2 Modifications on the machine :

For safety reasons, it is not allowed to the user to carry out modifications or conversions on the machine himself without the manufacturer's authorization. This machine is only to be equipped with original spare parts which have especially been designed for this appliance and which meet with the manufacturer's specifications. Installation or use of extra equipment or of specials may reduce the operating safety.

The manufacturer cannot be held liable for any damage caused by the use of **non-original** spare parts or of extra equipment.

3.0 Safety regulations

3.1 Proper use :

The vibration roller RW 1800 is manufactured according to the latest technology and recognized safety standards. In spite of this, the use of the roller may involve risks for life and health of the user or of third persons, respectively damage to the machine itself or to other objects if :

- it is used for other purposes than those for which it has been built
- it is improperly modified or converted
- the safety regulations are not kept to
- it is not operated and/or serviced by skilled staff

The RW 1800 must only be used in technically perfect condition for the applications for which it is properly intended and with a due sense of concern for safety and awareness of possible dangers according to the operating instructions. Especially disturbances which might affect the safety of the machine must immediately be eradicated.
For operation of the roller, the relevant regulations for prevention of accidents, the standard safety rules and the regulations which are in force in each country do, of course, apply.

The paragraph „Fields of application“ (2.1) defines the applications for which the RW 1800 is exclusively determined. Any different use or use going beyond these applications is improper. The manufacturer/supplier cannot be held liable for any damage or injury which might result from such improper use. The user alone must assume full responsibility for the results of improper use of the machine.

3.2 Operating the roller :

Only skilled workers over 18 years who have been trained on the roller and who have been instructed to do such work are allowed to operate the machine. Competences and responsibilities must be clearly determined before operation is started and must be strictly kept to.
Every person charged with operation, maintenance or repair of the roller must read and observe the safety regulations. The user company may have this confirmed through the operator’s signature.
Persons who are under the influence of drugs, medicine or alcohol must neither operate the roller nor carry out maintenance or repair works.
Maintenance and repair works require special knowledge and must, therefore, only be carried out by skilled staff.

3.3 Safety remarks in the operating/maintenance manual :

Danger : Where this sign appears, situations are mentioned in which persons might be exposed to danger.

Attention :

Where this remark appears, information is given about possible disturbances on the machine or on machine components.

Note :

Under this remark, technical information providing for the optimum economical use of the machine is given.

3.4 Warning stickers on the roller :

Safety labels and warning stickers must be kept completely legible and must absolutely be observed.

Damaged and illegible safety labels and warning stickers must immediately be renewed.

All labels and stickers can be ordered according to our spare parts list.

3.5 Loading the roller :

- Do only use stable ramps with a sufficient load capacity for loading. The ramp's inclination must not be steeper than the roller's gradeability provides for (see „Technical specifications").
- The roller must be secured against tipping or sliding on the ramp.
- The roller must be secured for transport so that it cannot tip over, slide or roll.
- Take care that a roller suspended during loading does not swing heavily.

There is danger to life for persons who

- step under suspended loads or who stand underneath suspended loads.
- keep in the roller's operating radius during instruction on the machine or when the machine is loaded.

3.6 Towing the roller :

Do always use a tow-rod when towing the machine !

The maximum towing speed must not exceed 1 km/h. The maximum distance, over which the machine is towed, must not be longer than 200 m.

Secure the roller in order to prevent it from unintentionally rolling off when the disk brake is released mechanically.

3.7 Checking the roll-over protective support (ROPS) :

The frame must not be damaged nor warped nor show cracks in the ROPS-roof mounting zone, neither must the ROPS-roof show hairline cracks, rusty spots or open fractures.

If the ROPS-roof vibrates or rattles heavily, it is not correctly fitted. Then, all screw connections must be tightened according to the given specifications (observe torques). The fastening screws must not be damaged, bent or deformed.

Without the manufacturer's consent, it is not allowed to weld or screw on any additional parts as this could affect the roof's solidity and thus the safety of the operator. It is prohibited to drill holes or erode sparings in the ROPS-roof mounting zone by heat as this would also affect solidity.

3.8 Starting the roller :

3.8.1 Before start-up :

- The operator must make himself familiar with the equipment, with operating and control elements as well as with the functioning of the machine.
- The operator must make use of his personal protective equipment such as safety helmet, safety boots, ear protection etc.

Before start-up, always check whether :

- there are persons or obstacles beside or underneath the roller.
- the roller is free of oily or inflammable substances.
- all levers are free of grease, oil, fuel, dirt, snow or ice.
- the roller shows any obvious defects.
- all safety devices are firmly in their place.
- brakes, steering and operating elements do properly work.
- the driver's seat is correctly adjusted.

- Never start the roller if instruments, control lamps or control elements are defective.

- Do not attach any loose objects to the machine.

- Use the provided stairs, steps and grab handles when getting on the roller.

Danger : - **The safety belt must always be fastened on machines which do have a ROPS-roof (roll-over protective support) !**

3.8.2 Start-up :

Do only start and operate the machine when sitting on the driver's seat.

For starting the roller, all control levers must be placed in **„neutral position".**

Check all indicator and control elements after start-up.

3.8.3 External start with battery cable connection :

Attention :

The roller is equipped with a **12 Volt system** !

Connect positive with positive and negative with negative poles (ground cable) - the ground cable must always be the last to be connected and the first to be disconnected ! When wrong connections are effected, serious damage is caused to the machine's electrical system.

3.9 Driving the roller :

3.9.1 Persons in the danger area :

Before starting operation - even after short breaks - and especially when driving in reverse, check whether persons or obstacles keep in the danger area.

Give warning signs if necessary and stop operation immediately if persons do not leave the danger area in spite of the warnings.

Do never step in or keep in the roller's articulation zone while the engine is running. **Danger of getting crushed !**

3.9.2 Driving :

- In cases of emergency or danger, the engine must immediately be stopped. Do only start operation again after the danger, due to which operation was stopped, has been removed.

- The roller must not be used as a means of transport for persons.

- In case of unusual noise or smoke development, stop the machine, find out the reason and have the damage corrected.

- Do only operate the roller when sitting on the driver's seat.

- Do never adjust the driver's seat while you are driving the roller.

- Do never get on or off the machine while you are driving the roller.

In case that the roller has got in touch with a live wire :

- do not leave the driver's seat
- warn third persons against approaching or touching the machine
- drive the machine out of the danger area if possible
- have the current supply interrupted

3.9.3 Driving on slopes :

- Do not drive on slopes which are steeper than the roller's gradeability provides for.
- Drive carefully on slopes and always straight up or down in direction. Choose a low gear before you start driving.
- On humid and loose-packed soils, the roller's ground adherence on slopes is considerably reduced. **Increased danger of accidents !**

3.9.4 Conduct in traffic :

- Choose speed in accordance with the working conditions.
- Do always give priority to loaded transport vehicles.
- Keep a safe distance to edges and hill flanks.

3.9.5 Checking the effects of vibration :

When carrying out compaction works with vibration, the effects on nearby buildings and pipes lying in the ground (gas, water, sewerage, current conduction) must be checked and, if necessary, the compaction work must be stopped.
Never use vibration on hard ground (concrete or frozen soils); damage could be caused to the bearings !

3.9.6 Parking the roller :

If possible, park the roller on even, firm ground.

Before leaving the machine :

- straighten the articulation joint in order to allow for easy mounting respectively getting off the machine.
- stop the engine and remove the ignition key.
- place the levers in neutral position.

Secure parking machines, which might constitute an obstacle to traffic, by conspicuous measures.

Do not jump down from the machine; always get down using the grab handles, stairs and steps provided.

3.9.7 Parking on slopes :

Secure the machine against rolling away by placing metal wheel chocks in front of and behind the drums.

3.9.8 Start-up in closed rooms :

Exhaust gases are highly dangerous !
When starting the roller in closed rooms, it is, therefore, indispensable to provide for sufficient ventilation.

3.10 Taking in fuel :

- Do not breathe in fuel vapours.
- Do only refuel the roller with the engine stopped.
- Do not refuel the tank in closed rooms.
- No open fire, do not smoke.
- Do not spill fuel; catch fuel running out before it can seep away into the soil.
- Do only make mixtures of diesel and petrol (never use supergrade petrol) inside the fuel tank itself. Fill in the necessary quantity of petrol first, then top up with diesel. Such diesel/petrol mixtures are as inflammable as petrol is.

3.11 Maintenance works :

- Only skilled and trained staff is allowed to carry out maintenance works.
- Keep away unauthorized persons from the machine.
- Do never carry out maintenance works on a driving machine or with the engine running.
- Park the machine on even and stable ground.
- Remove the ignition key.
- Secure the articulation joint by using the transport brace.

3.11.1 Working on hydraulic hoses :

Before carrying out any kind of work on the hydraulic system, make sure that this is not under pressure. Hydraulic oil escaping under pressure can penetrate the skin and cause bad injuries. In case that such injuries have been caused, it is important to go to see a doctor immediately as, otherwise, serious infections could result.

For adjustment works on the hydraulic system, never step in front of or behind the drums.

Do not misadjust the pressure control valves.

Let hydraulic oil drain off at working temperature. - **Danger of scaldings !**

Collect the hydraulic oil drained off in a suitable container and dispose of in an environment-friendly manner.

Do never start the engine when the hydraulic oil has been drained off.

After any kind of work, check whether there are leaking connections and fittings (with the system still kept without pressure !!).

3.11.2 Replacing hydraulic hoses :

The hoses must not be mixed up.

Make visual checks on the hydraulic hoses in regular intervals.

It is indispensable to replace hydraulic hoses immediately if :

- skin and/or inset are damaged (e. g. abrasions, cuts)
- the skin is embrittled (cracks in the hose material)
- deformation if not under pressure or if under pressure, which does not correspond to the original hydraulic hose form
- deformation when being bent, e. g. crushes, kinks, separated layers, blistering
- leaking points
- installation has not been carried out properly
- the hydraulic hose moves out of its mounting
- the mountings are corroded so that function and tightness are reduced
- the mountings are damaged or deformed so that function and tightness or the connection between two hoses are reduced

Only the use of the original RAMMAX replacement hydraulic hoses guarantees that the correct hose type (pressure rating) is used in the right place.

3.11.3 Working on the engine :

Let engine oil drain off at working temperature. - **Danger of scaldings !**

Wipe off overflowing oil, catch oil running out and dispose of in an environment-friendly manner.

Keep used filters and other oily material in a separate, especially marked container and dispose of in an environment-friendly manner.

3.11.4 Working on electrical system components :

- Before carrying out any work on the electrical components, disconnect the battery and cover it with insulating material.
- Do not install fuses with higher amperage nor mend fuses. **Fire risk !**

3.11.5 Working on the battery :

- No open fire when working on the battery, do not smoke.
- Do not allow acid to come into contact with skin or clothing. In case of injuries by battery acid, wash with clear water and go to see a doctor.
- Do not place tools on top of the battery.
- Dispose of old batteries in the proper way.

3.11.6 Working on the fuel system :

No open fire, do not smoke, do not spill fuel.
Catch fuel running out before it can seep away into the soil and dispose of in an environment-friendly manner.

3.11.7 Cleaning works :

- Never carry out cleaning works with the engine running.
- Never use petrol or other easily inflammable substances for cleaning.
- When cleaning with the steam jet cleaner, cover all electrical components and the insulating material or do not expose them directly to water or steam jets.
- Do not hold the cleaning jet directly onto the sound absorber.

3.11.8 After the maintenance works :

- Install any protective devices again after having carried out cleaning and maintenance works.
- Carry out a performance test.

3.12 Repair :

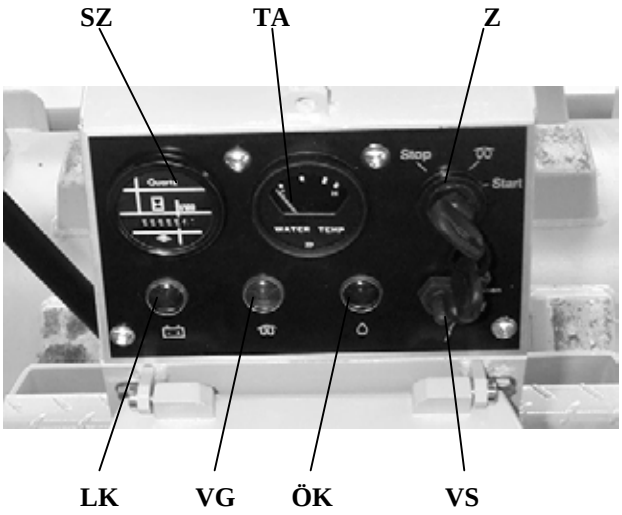
If the machine is defective, hang a corresponding warning sign on it.

Repair works are only to be carried out by skilled staff having been instructed to do so.

Exhaust gases are highly dangerous ! When starting the roller in closed rooms, it is, therefore, indispensable to provide for sufficient ventilation.

4.0 Indicator and control elements

Fig. 4



TA : Fuel gauge
Z : Ignition switch
VS : Vibration switch
ÖK : Oil pressure control lamp
VG : Pre-ignition indicator
LK : Charge control lamp
SZ : Hourmeter

Fig. 5

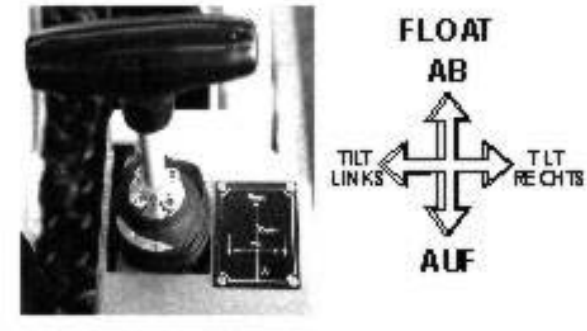


Fig. 6

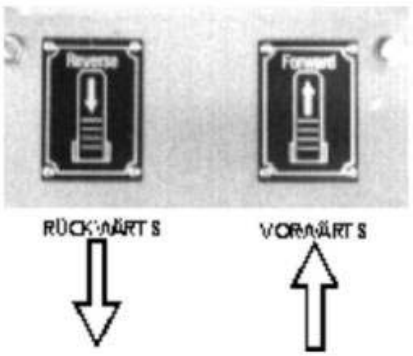


Fig. 7

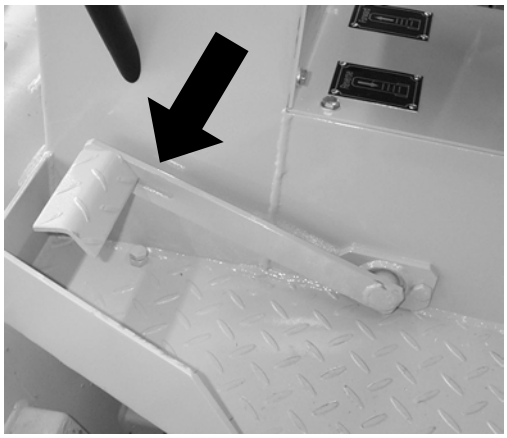
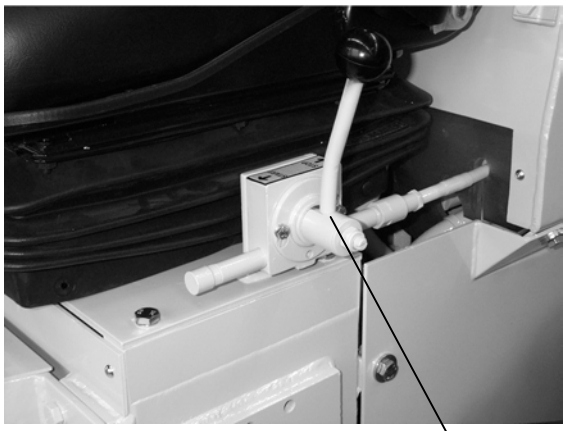
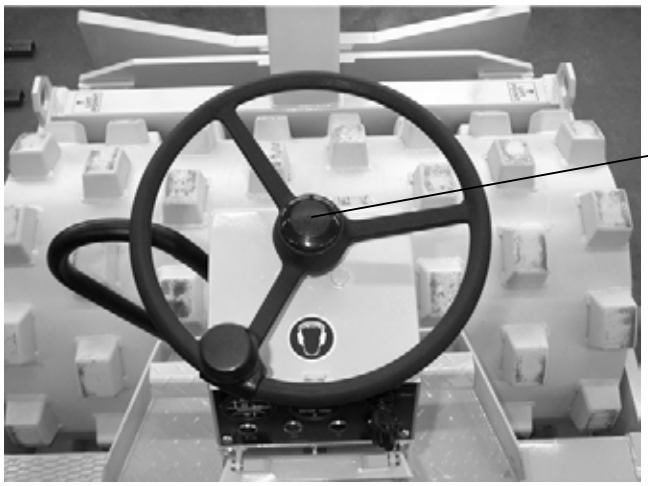


Fig. 8



GH : Throttle control lever

Fig. 9



HK : Horn

4.1 Description of the indicator and control elements

LK : Charge control lamp

lights up : - when the ignition is engaged
- in case of charging disturbances during operation; find out the reason

goes out : - after the engine has been started

ÖK : Oil pressure control lamp

lights up : - when the ignition is engaged
- at decrease of oil pressure during operation, **stop the engine immediately**

goes out : - after the engine has been started

GH : Throttle control lever

position „ 0 “ : - stop the engine

position „ I “ : - start the engine
- operating position for driving and vibration

Z : Ignition switch

position „ 0 “ : - put in or remove the ignition key

position „ I “ : - ignition engaged, charge control lamp „LK“ and oil pressure control lamp „ÖK“ light up

position „ II “ : - Turn the ignition key against spring pressure to position „II“, the engine will start. Release the key after start-up, the control lamps will go out.

Note :

The ignition lock is equipped with a stop-work for repeat start. For repeat start, the ignition key must first be turned to position „0“.
Only repeat the starting procedure for a maximum of 15 to 20 seconds without interruption, then stop for about one minute before trying again. If the engine can still not be started, look for the reason of this disturbance and remove it.

SZ : Hourmeter

The hourmeter counts the operating hours at running engine.

Maintenance works are to be carried out according to the operating hours indicated.

HK : Horn

Push-button for horn signal.

5.0 Operation

5.1 Control before use :

The following control steps must be carried out before taking the roller into operation, for daily work as well as before starting longer working periods.

Danger :

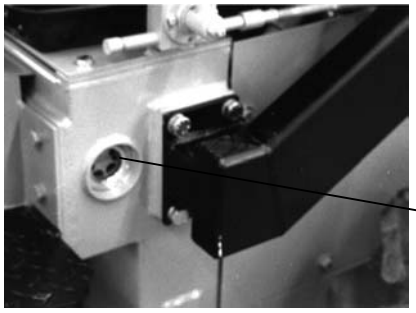
Strictly keep to the safety regulations as described under paragraph 3.0 of this operating and service manual.

- Park the machine on even, firm ground.

Check :

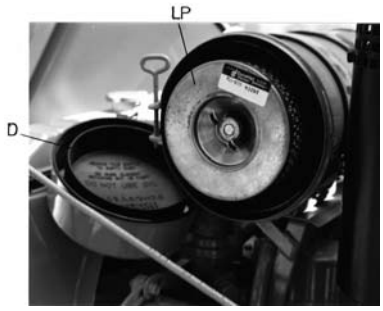
- whether all screw connections are tight
- on leaks in fuel tank or fuel pipes
- on possible damage to machine or engine
- function of the drive pedal
- function of steering
- on leaks in the hydraulic system

Fig. 10



Check the hydraulic oil level and refill if necessary.

Bild 11

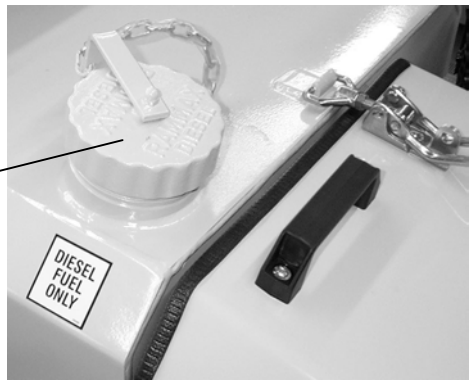


Check whether the air filter is heavily polluted.

Fig. 12

Check the fuel reserves and refill if necessary.

Bild 13

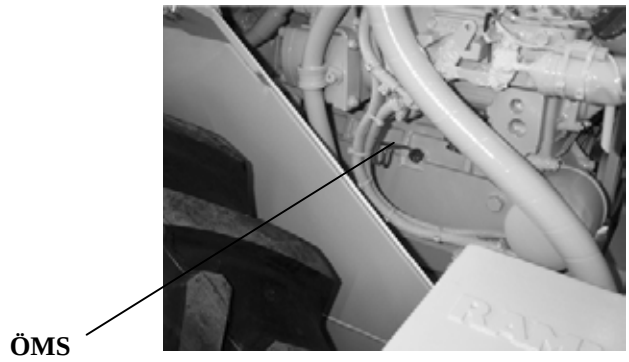


Feeder opening for diesel fuel.

Fig. 14

Check the air pressure in the rubber tires.

Fig. 15



Check the engine oil level.

Fig. 16

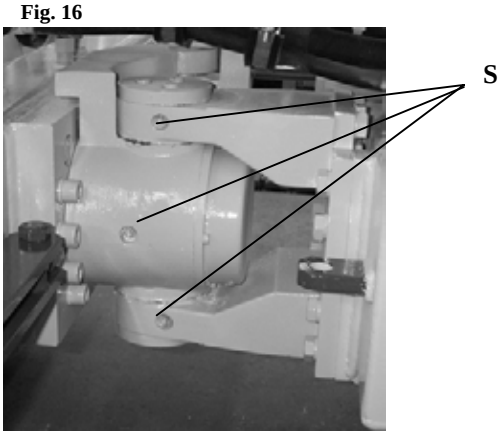
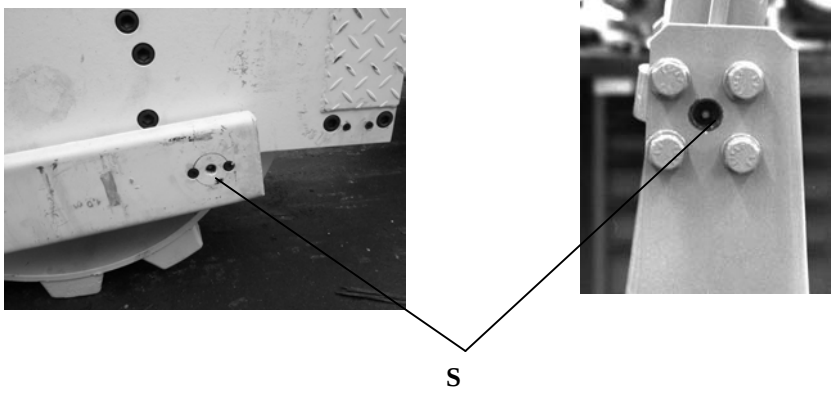


Fig. 17



Strictly observe the lubrication intervals indicated in the maintenance instructions and check the relevant components on a daily basis !

Note :

The following control steps are described under paragraph 8.0 „Maintenance“ :

- engine oil level
- hydraulic oil level
- fuel supplies

5.2 Operation :

Attention :

- Avoid any type of work which might seem to be hazardous or which might reduce the stability of the machine.
- Do not drive on slopes in transverse direction. Always drive straight up or down.
- The roller must only be started with the operator sitting on the driver's seat.
- Before leaving the driver's seat, the operator must always make sure that the machine is secured against rolling away unintentionally or against unauthorized putting into operation.

Danger :

Before moving the roller, make sure that there are no persons in the danger area.

It is not allowed that persons keep in the roller's articulation area while the engine is running.

On humid and loose-packed soils, the roller's ground adherence on slopes is considerably reduced.

When driving on slopes, the working speed must be chosen in accordance with the conditions given on the site.

The nature of the ground and the atmospheric conditions prevailing may reduce the roller's gradeability.

Do never drive on slopes which are steeper than the roller's gradeability provides for.

Do always give priority to loaded transport vehicles.

5.3 Start-up :

Attention :

In case that you have not yet made yourself familiar with the indicator and control elements of the machine, it is absolutely indispensable that you go back to the previous chapter 4.0 „Indicator and control elements" and that you read this carefully. In this chapter, all indicator and control elements are described in detail.

When operating the roller, strictly keep to the safety regulations described in chapter 3.0 „Safety regulations" !

Danger :

The safety belt must always be fastened when driving on machines which do have a ROPS-roof (roll-over protective support) !

It is only allowed to operate the roller when the driver is sitting on the driver's seat with the seat belt fastened (Fig. 18).

Fig. 18

5.4 Starting the engine :

1. Place the throttle lever in position „Start“ (Fig. 8).
2. Place the lever for blade operation in neutral position (Fig. 5).
3. Turn the ignition switch „Z“ in position „I“ (Fig. 4).
4. Place the vibration switch „VS“ in neutral position (Fig. 4).
5. The foot pedals must not be actuated while the engine is started (Fig. 7).

Oil pressure control lamp „ÖK“ and charge control lamp „LK“ light up.

Keep to the starting instructions of the engine manufacturer.

- **Turn the ignition switch to position „II“ and the engine will start.**
- **Release the ignition key immediately as soon as the engine is running.**

Attention :

The starter must under no circumstances be actuated while the engine is running. When this is not observed, serious damage may be caused to starter and starter gear rim.

Note :

Before starting operation, let the engine warm up in idle running for a short time.

5.5 Starting with battery cable connection :

Attention :

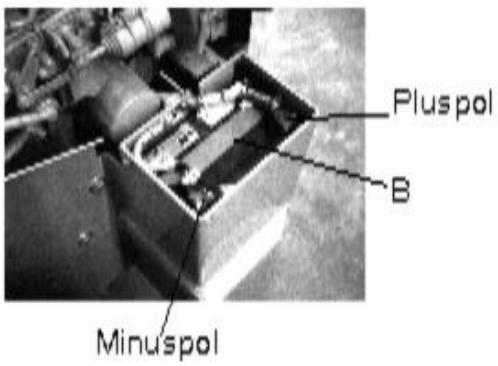
When starting the roller by battery cable connection, it must absolutely be observed that, first, the positive poles are connected and then only the negative poles (ground cable).

After the engine has started, the negative poles must be disconnected first and the positive poles last.

If this is not observed, serious damage may be caused to the roller’s electrical system.

- **The RW 1800 is equipped with two batteries which are located on both sides of the oil tank.**
- **For external start, it is sufficient to unscrew the cover of one of the battery compartments. The roller can be started from either side at choice (Fig. 19).**

Fig. 19



5.6 Driving :

The machine is moved by actuating the foot pedals.

When actuating the left foot pedal, the roller will drive in reverse, when actuating the right foot pedal, it will move forwards.

The speed can be regulated continuously through the excursion of the pedals (Fig. 6 and 7).

5.7 Vibration :

Vibration is switched on when actuating the rocker handle switch „VS“ (Fig. 4).

Note :

- **Machines that are equipped with a dozer blade can only carry out compaction works with the blade lifted up (blade in uppermost position).**
- **Levelling and compacting at the same time is not possible.**

Important :

- **Do only carry out any compaction works at maximum engine speed !**

⚠ **Danger :**

When carrying out compaction works with vibration, the effects on nearby buildings must be checked and, if necessary, the compaction work must be stopped.

5.8 Operating the dozer blade :

The dozer blade is operated by the control lever (Fig. 5).

1. Control lever to the back : dozer blade is lifted up
2. Control lever to the front : dozer blade is let down
3. Control lever to the left : dozer blade turns to the left (tilt capacity)
4. Control lever to the right : dozer blade turns to the right (tilt capacity)
5. Control lever on „ FLOAT “ : dozer blade float capacity (when driving in reverse for scraping the ground)

Note :

Before stopping the engine, the dozer blade must always be deposited to the ground.

⚠ **Danger :**

It is not allowed to transport persons on the dozer blade.

It is prohibited to move other vehicles with the dozer blade.

5.9 Stopping the roller :

1. Place the throttle control lever in positon „Stop“ (Fig. 8).
2. Before stopping the engine, let it run idle for a short time in order to allow for temperature balancing.
3. Place the ignition key in position „0“ (engine stop) (Fig. 4).

Attention :

Before stopping the engine, straighten the articulation joint in order to make it easier for the operator to get on or down from his driver’s seat.

After having stopped the roller, the ignition key must be removed. The dashboard cover must be locked in order to protect the machine against damage or vandalism.

Before stopping the engine, the dozer blade must always be deposited to the ground.

Do always use shackles when parking the machine on slopes.

6.0 Adjusting the driver’s seat :

Fig. 20

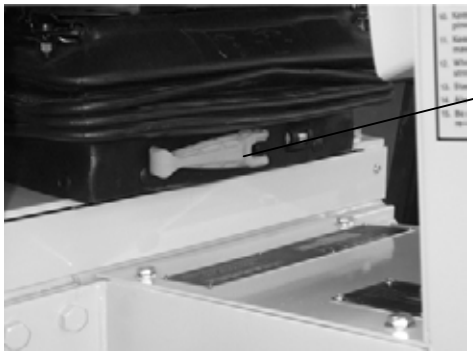
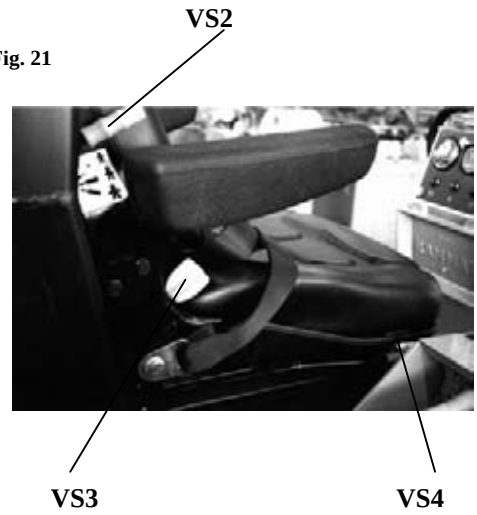


Fig. 21



Danger :

It is strictly forbidden to adjust the driver’s seat during operation - danger of accidents !

The safety belt must always be fastened when driving on machines which do have a ROPS-roof (roll-over protective support) !

How to adjust the driver’s seat :

Lever VH1 : for adjustment according to the driver’s weight (besides the lever, on the right, there is a scale giving the weight adjustment) (Fig. 20)

Lever VS2 : regulates the seat resilience (Fig. 21) (heavy - medium - light)

Note :

Under the driver’s seat, there is an end switch which is actuated over the driver’s weight. The lever VS2 must not be adjusted too strong (heavy) as, otherwise, the end switch cannot be actuated.

Consequence : The roller cannot be started.
Remedy : Choose weaker seat resilience.

Lever VS3 : The inclination of the back of seat can be regulated by turning the adjusting button.

Lever VS4 : The complete driver's seat can be moved forwards or backwards.

7.0 Loading and transport :

- For loading the roller with a lifting device, a hinged lifting support „HB" is installed on the roller's roof (Fig. 25).
- The roller can also be loaded by driving up a suitable loading ramp under its own power.

Fig. 22

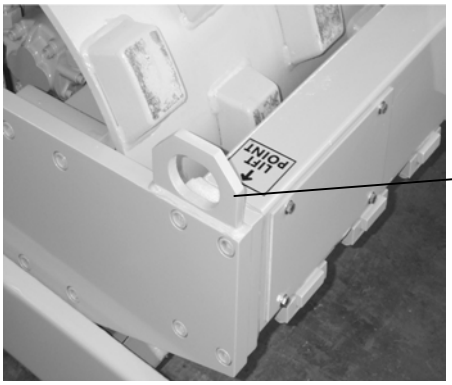
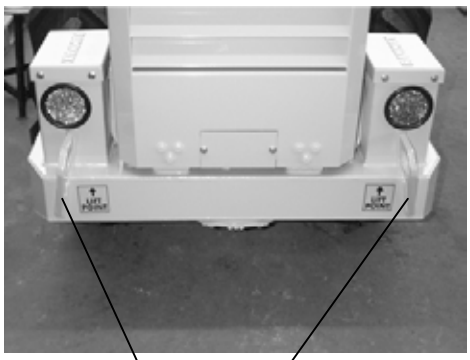


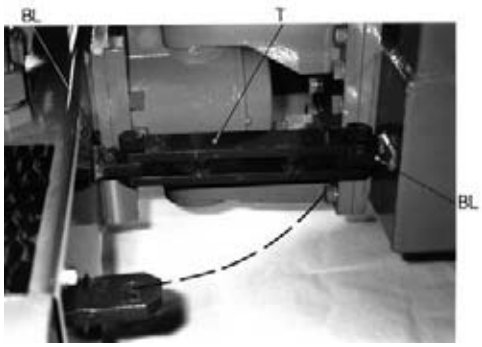
Fig. 23



Attention :

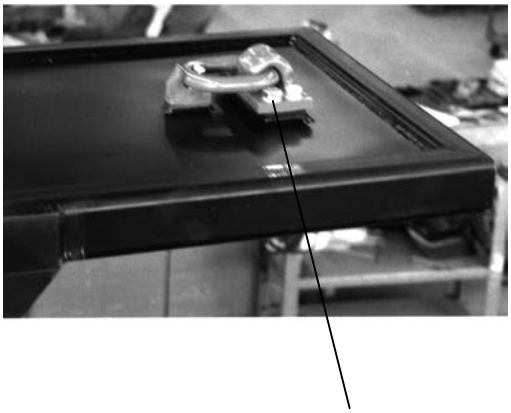
- In order to avoid any danger or risk to persons, do only use ramps with a sufficient load capacity and which are safely secured.
- For lashing down the roller, always use shackles which can be firmly tied to the transport hoops „TÖ" (located in front and rear of the machine) (Fig. 22/23).
- In order to avoid any danger or risk to persons, the roller must be lashed down for transport in a manner that it is secured against tipping over, sliding or rolling down.
- Do never step under suspended loads or stand underneath suspended loads.

Fig. 24



After the machine has been driven up onto the transport vehicle, the transport securing brace „T“ must be swung out and must be screwed down to the mounting „BL“ on the oil tank (Fig. 24).

Bild 27



HB

Attention :

After transport, the transport securing brace must be released again and must be attached to the mounting „BL“ provided on the tie-bar for this purpose !

8.0 Maintenance

8.1 General remarks on maintenance and maintenance work :

Strictly keep to all safety regulations when carrying out maintenance works !

Careful maintenance guarantees a much better functioning safety of the roller and prolongs the life of all important components. The time and work required for this purpose are out of all proportion to any disturbances which might occur due to non-observance.

- Engine and machine must be thoroughly cleaned before any maintenance work is carried out.
- The engine must be inactive during any maintenance work.
- Before carrying out any work on the hydraulic system, make sure that this is not under pressure.
- Before carrying out any work on the electrical components, disconnect the battery and cover it with insulating material.
- The electrical equipment of the machine must be inspected regularly. Any faults (e.g. loose connections or burnt cables) must immediately be corrected and the affected parts replaced.
- Do only carry out maintenance and repair work when the machine is standing on even, stable ground and is secured against rolling away.
- Ensure that any maintenance and inspection work provided for and described in the operating instruction is carried out, including instructions on replacement of parts. Such work must only be done by **skilled and qualified staff.**
- During maintenance works, neither oil nor fuel must get into ground or drains. These must be caught up in suitable containers and disposed off in an environment-friendly manner !

Remarks on the hydraulic system :

Avoid any dirt or other polluting particles to get inside the hydraulic system. Even the smallest dirt particles inside the hydraulic circuit may cause enormous disturbances to the aggregates leading to expensive repair works.

- When realizing in daily inspection of the hydraulic oil level that this has fallen, it is indispensable to immediately check the complete hydraulic circuit on possible leaks.
- Do immediately eliminate any leaks. If necessary, inform the responsible service station.
- Fill up the hydraulic system with filling aggregate as possible.
- Clean fittings, tank cap and surroundings before removing them in order to avoid that dirt gets inside.
- Do not leave the tank feeder open without reason but always keep it covered in order to prevent particles from falling inside the tank.

8.2 Instructions for running-in :

Maintenance after 25 operating hours :

- Check all screw connections and tighten where necessary.
- Check all hydraulic hoses and the whole hydraulic system on possible leaks.
- Change the fuel filter (Fig. 30, paragraph 8.7).
- For the engine, see the maintenance instructions for Kubota D-1403 !

8.3 Maintenance schedule

No. :	Description :	Remarks :	Page :
	Daily		
8.4	- check engine oil level	- observe reference mark	34
	- examine whether the roller shows exterior damage	- visual check	
8.5	- check hydraulic oil level	- oil level gauge	34
8.6	- check fuel supplies	- inspection glass	35
	- check cooling water level		40
	- examine air filter		37
	- check inflation pressure		41
	- for the diesel engine, see operating instructions for Kubota D-1403	(appendix)	
	After 20 operating hours		
	- check whether all screws are still tight	screw torques	
	- grease all lubricating nipples		25
8.7	- change fuel filter		35
	- for the diesel engine, see operating instructions for Kubota D-1403	(appendix)	
	After 75 operating hours		
8.13	- change pipe filter		39
8.8	- battery maintenance	lubricate the poles	36
	- Attention: engine oil for diesel engine (see Kubota D-1403 operating instructions)	(see appendix)	
	Every 100 operating hours		
8.10	- clean and change the air filter cartridge (earlier if necessary)		37
	- tighten the screws on the side pieces and on the articulation joint		36
	Every 200 operating hours		
8.9	- check whether all screws are still tight	screw torques	
8.7	- change diesel filter		35
	- check all diesel pipes on possible leaks		
	Every 500 operating hours		
	- for the diesel engine, see operating instructions for Kubota D-1403	(see appendix)	
8.13	- change pipe filter		39
	Every 1000 operating hours		
8.12	- change hydraulic oil (at least once a year)		38
8.7	- change fuel filter		35
8.13	- change suction filter		39
	As required		
8.14	- adjust the scrapers		40
	- check whether all screws are still tight	screw torques	
	- engine maintenance	see Kubota D-1403 (appen.)	

8.4 Checking the engine oil level :

Note :

Place the roller on even, firm ground in horizontal position.

- Pull out the oil dip stick „ÖMS“ and wipe it clean with a fibre free cloth (Fig. 26).
- Put in the oil dip stick as far as it will go and pull it out again.
- The oil level must be indicated between the two reference marks.
- If the oil level indicated lies below the lower reference mark, immediately refill oil.

For oil type, please see the operating instructions for Kubota D-1403 !

Fig. 26

8.5 Checking the hydraulic oil level :

Note :

Place the roller on even, firm ground in horizontal position.

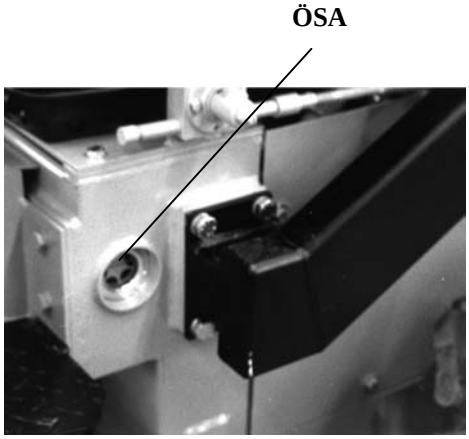
- Check the hydraulic oil level through the oil level gauge „ÖSA“ :

  The oil level must at least be indicated in the middle of the oil level gauge (Fig. 27).

- Refill hydraulic oil if necessary.

Recommended oil types : Mobil HPL 46,
Texaco Rando HD-C.

Fig. 27



Corresponding oil types of other producers can also be used.

Note :

When realizing in daily inspection of the hydraulic oil level that this has fallen, all aggregates, lines and hoses must immediately be checked on possible leaks. Refill missing hydraulic oil before taking the roller into operation.

8.6 Checking the fuel supplies :

Danger :

Fire risk !

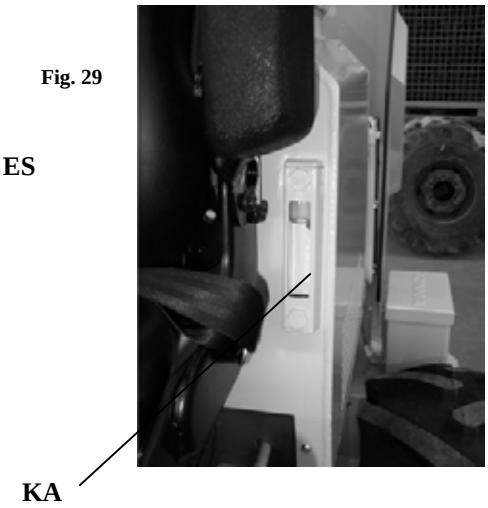
No open fire, no smoking during works on the fuel system.

Do not fill in fuel in closed rooms.

Do not breathe in fuel vapours.

Fig. 28

Fig. 29



Attention :

Polluted fuel may cause failure or damage to the engine. If necessary, pour fuel through a sieving filter (Fig. 28).

Clean feeder surroundings and fill in fuel.

Fuel : see operating instructions for Kubota D-1403 ! (Appendix)

8.7 Changing the fuel filter :

- **The diesel pipe filter „DF“ must be changed at least once a year or every 200 operating hours (Fig. 30).**
- **Changing the fuel filter :**

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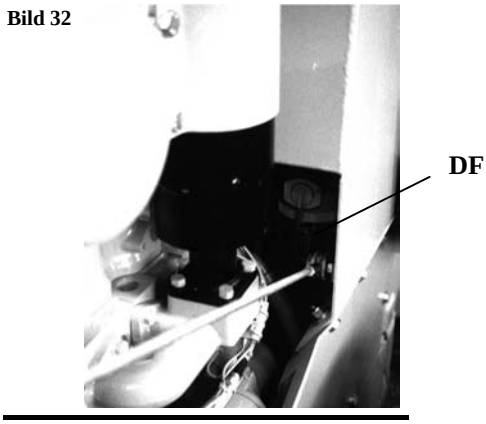


- Unscrew both pan head screws „S“ from the filter mounting and remove the diesel filter „DF“ (Fig. 30).
- Draw off the fuel hoses and insert the new diesel filter „DF“. Replace leaking or porous fuel hoses.
- Install the diesel filter „DF“ in reversed order again and examine whether there are leaking points.

Attention :

No open fire, no smoking during works on the fuel system.

- The fuel system is self-ventilating.

Attention :

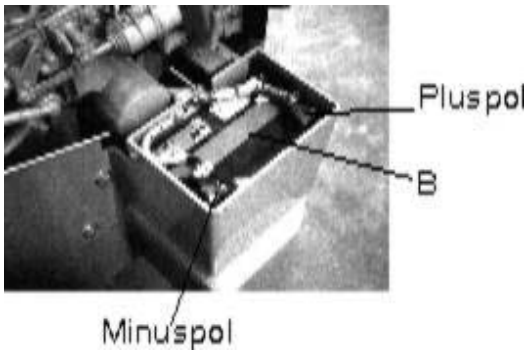
Collect any fuel spillage carefully and dispose of together with the used fuel filter in an environment-friendly manner !

8.8 Battery :

Danger :

- No open fire, no smoking during works on the battery !
Do not allow acid to come into contact with skin or clothing !
Wear safety glasses !
Do not put tools on the battery !

Fig. 31



The batteries “B” are located on the left and right sides of the oil tank (fig. 31). It is very important to keep clean the battery and to carry out maintenance correctly in order to have a perfect function of this battery. If the machine is out of action for a longer period of time the battery has to be pinched off in order to prevent a deep discharge. Especially the terminals and clamps must be cleaned regularly and afterwards be greased thickly with an acidproof grease.

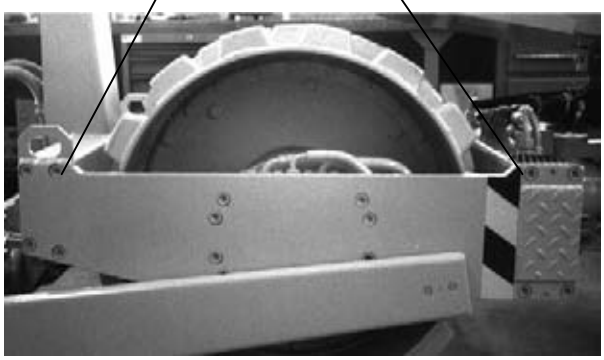
Attention :

Dispose of used batteries properly.

8.9 Tightening the screws :

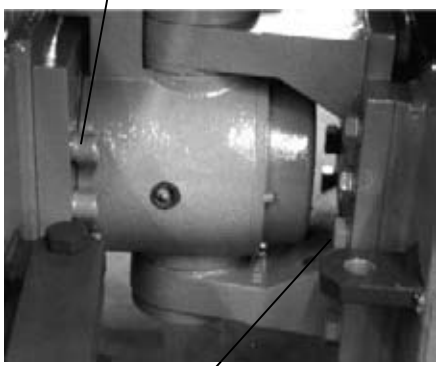
Pan head screw M 16 x 25 DIN 912-8.8
Screw torque 300 NM / 221 ft-lb

Fig. 32



Pan head screw M 16 x 40 DIN 912-8.8
Screw torque 220 Nm / 165 ft-lb

Fig. 33



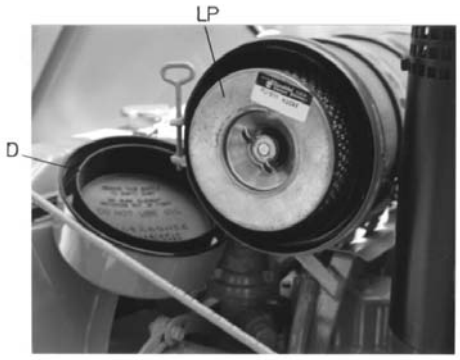
Hexagon head cap screw M 16 x 40 DIN 933-8.8
Screw torque 220 Nm / 165 ft-lb

8.10 Checking, cleaning and replacing the air filter :

Changing the air filter cartridge :

- Remove cover „D“ from the air filter housing and take out the air filter cartridge „LP“.
- After having inserted the cleaned or new air filter cartridge, refit cover „D“ again (Fig. 34).

Fig. 34



Attention :

Never use petrol nor hot fluids for cleaning the filter cartridge !!!

After having cleaned the filter cartridge, check on possible damage with a pocket lamp.

Filter cartridges which show damage to the gasket or to the cartridge itself must absolutely be replaced.

The air filter cartridge must be replaced after having been cleaned three times or after one year in use at the latest.

It is not possible to clean the filter cartridge if it is polluted by deposit containing soot particles ! Use a new cartridge then !

Make a note on the cartridge cover of each cleaning carried out.

Insufficient cleaning and treatment of the filter cartridge may cause serious damage to the engine !!!

Dry cleaning :

Danger :

Eye injuries possible ! Wear safety clothing (glasses, gloves) !

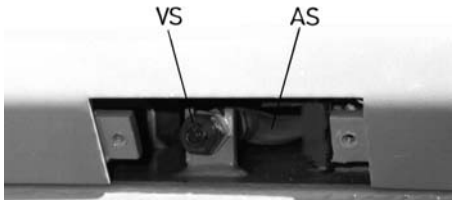
- Blow out the filter cartridge with dry compressed air (maximum 5 bar) from the inside to the outside.

Wet cleaning :

Clean the filter cartridge in lukewarm water with usual commercial mild-action detergent by waving it from one side to the other. Afterwards, flush with cold water carefully, hydro-extract and dry thoroughly.

8.11 Changing the engine oil :

Fig. 35



Note :

Drain off engine oil only when the engine is warm.

For intervals for changing the engine oil, see the operating instructions for Kubota D-1403 (appendix).

Fig. 36

Danger :

Risk of scaldings when draining off hot engine oil !

Loosen oil drain hose „AS“ and remove plug „VS“. Let the oil drain off into a suitable container and dispose of in an environment-friendly manner (Fig. 35).

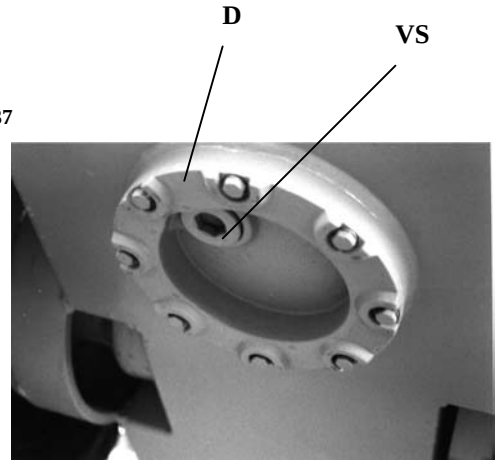
Changing the oil filter (see operating instructions for Kubota D-1403).

Fill in oil.

Replace the oil drain hose again and fill in new oil through the feeder opening „E“ (Fig. 36).

8.12 Changing the hydraulic oil :

Fig. 37



Danger :

Risk of scaldings when draining off hot hydraulic oil !

8.12.1 Hydraulic system

Maintenance work on the hydraulic system is usually restricted to the filters and the hydraulic oil tank. The other aggregates do not require maintenance. However, the hydraulic hoses should be checked on possible leaks in regular intervals. Do never spray-paint the hydraulic hoses.

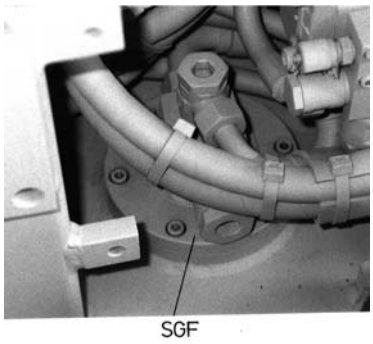
8.12.2 Changing the hydraulic oil

Remove drain plug „VS“ on the bottom side of the oil tank and let the hydraulic oil drain off into a suitable container. ➡ Open cover „D“ and wash out the oil tank thoroughly (Fig. 37). ➡ Install both covers „D“ equipped with new seals and screw in the drain plug into cover „D“. ➡ Change both pipe filters (Fig. 40/xx). ➡ Renew the suction filter (Fig. 39) as well. ➡ Fill in hydraulic oil through the feeder opening „E“ located underneath the driver’s seat until the oil level can be seen in the oil gauge (Fig. 38). ➡ Start the engine and let it run in idle running for a short time. ➡ Check the oil level in the oil gauge again (Fig. 10) and refill if necessary. ➡ Tank capacity : about 60 l

Recommended oil types : Mobil HLP 46, Texaco Rando HD-C.
Corresponding oil types of other producers can also be used.

Fig. 38

Fig. 39



Attention :

Never start the engine with the hydraulic oil drained off ! Never have the pumps running without oil !

Note :

Works on the hydraulic system are only to be carried out by persons with special knowledge and experience with hydraulic systems. Let the oil drain off into a suitable container and dispose of the filter cartridge in an environment-friendly manner.

Recommendation : If larger repair works are carried out on the hydraulic hose system, the hydraulic oil should also be changed.

Fig. 40

8.13 Suction filter / pipe filter :

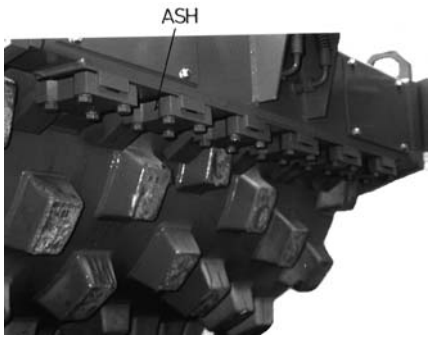
Note :

The suction filter „SGF“ must be changed after each hydraulic oil change and every 1000 operating hours as well (Fig. 40).

The two pipe filter cartridges LP1 and LP2 must be replaced after 75 operating hours and regularly every 500 operating hours or at least once a year (Fig. 40).

8.14 Adjusting the scrapers :

Fig. 41



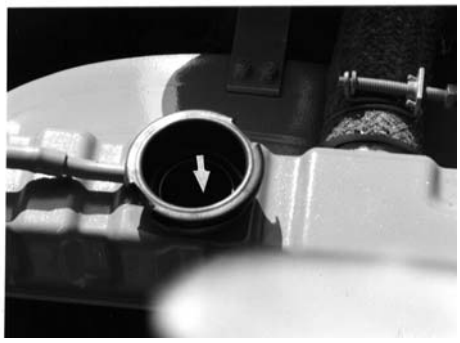
- Loosen all four screws on the scraper holder „ASH“ and push the scraper towards the drum.
- The distance between drum and scraper must be at least **2 mm.**
- Tighten the screws again (Fig. 41).

Note :

Worn down scrapers must be adjusted or replaced.

8.15 Radiator :

Fig. 42



The water cooling radiator of the diesel engine must at any time be filled up to the lower edge of the feeder (Fig.42). The roller is delivered ex factory containing an antifreezing compound effective up to 25° C below zero. The radiator must only be used with the cooling water containing corresponding antifreezing.

For repair works, the cooling water can be drained off through a drain cock which is located on the bottom side of the radiator.

Danger :

Risk of scaldings by hot water or steam. Works on the cooling system must only be carried out when the machine has cooled down.

Attention :

Dispose of process materials and replacement parts in a safe and environment-friendly manner !

8.16 Changing the tires :

Fig. 43

Danger :

When lifting loads, all safety regulations must strictly be observed !

Note :

The autolifter must have a load capacity of at least **2 t (2000kg)** !!!

- The machine must absolutely be parked on even, good bearing soil.
- Put on the autolifter or another appropriate lifting device and lift the machine slightly.
- Loosen the wheel nuts „RM“ and remove the rubber tire (Fig. 43).

Attention :

Keep in mind that the tire has got a considerable own weight !

- Put the new tire on the drive flange.
- Tighten the wheel nuts „RM“ crosswise.
- Screw torque : 150 Nm / 110 ft-lb
- Check the inflation pressure after having changed tires (2,5 bar).

9.0 Screw torques for screws with metric threads

Screw dimension	Torques Nm		
	8.8	10.9	12.9
M4	3	5	5
M5	6	9	10
M6	10	15	18
M8	25	35	45
M10	50	75	83
M12	88	123	147
M14	137	196	235
M16	211	300	358
M18	290	412	490
M20	412	578	696
M22	560	785	942
M24	711	1000	1200
M27	1050	1480	1774
M30	1420	2010	2400

Screw dimension	Torques ft-lb		
	8.8	10.9	12.9
M4	2	3	4
M5	4	7	7
M6	7	11	13
M8	18	26	33
M10	37	55	61
M12	65	91	108
M14	101	145	173
M16	156	221	264
M18	213	303	361
M20	304	426	513
M22	413	559	695
M24	524	798	885
M27	774	1092	1308
M30	1047	1482	1770

Property classes for screws with non treated, non greased surface. The screw's quality marks appear on the screw heads.

8.8 = 8G ; **10.9 = 10K ;** **12.9 = 12K**

The values give a 90 % utilization of the screw's apparent yielding point at a coefficient of friction of **μ total = 0,14.**

Observance of the screw torques is controlled by torquemeter. When lubricant MoSo2 is used, the indicated screw torques do not apply.

Note :

Always renew self-locking nuts after disassembly !

10.0 Trouble shooting table

Disturbance :	Possible cause :	Remedy :
No vibrating function !	Dozer blade is not placed in uppermost position.	- Bring dozer blade in uppermost position.
Engine is running, but the roller does not move !	Not enough hydraulic oil in the tank. Pedal valve defective.	- Check hydraulic oil level. - Check hydraulic system on possible leaks. - Check function of the pedal valve.
Engine will not start !	No connection effected for end switch under the driver's seat.	- Check seat's adjustment paragraph 6.0

YOUNGMAN RICHARDSON & CO. LTD.
6 - 10 Parkway Drive, Mairangi Bay, Auckland 0632
Ph: 09 443 2436 Auck Ph: 03 341 6923 Chch
www.yrco.co.nz